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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,211	07/18/2003	Matthew Englehart	MWS-055	4008

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LAHIVE & COCKFIELD
28 STATE STREET
BOSTON, MA 02109

EXAMINER

JACOB, MARY C

ART UNIT PAPER NUMBER

2123

DATE MAILED: 09/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/622,211

Applicant(s)

ENGLEHART ET AL.

Examiner

Mary C. Jacob

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/25/04.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-38 have been presented for examination.
2. The Preliminary Amendment, filed 3/8/05, adding claims 33-38 has been considered.

Drawings

3. Figures 1-14 are disclosed in the Background of the invention and should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Figure 4: 440, 442, 444, 445, 446, 448, 449, 450, 452, 454; Figure 5: 460, 462, 464, 466, 468; Figure 6A: 481, 482, 484, 486, 488, 490, 492, 494, 496, 498, 111; Figure 11B: 259.
5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Figure 8: 180, 182, Figure 13: 236.
6. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being

amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

7. The disclosure is objected to because of the following informalities. Appropriate correction is required.
8. Page 20, line 19 refers to element 66 in Figure 5 that points to an element in the figure, however, it appears that the elements in the figure were mis-labeled (see Drawing objections above) and element 66 should be element 466.
9. Page 40, lines 33-34 refer to element 16' in Figure 15 and should refer to element 416'.
10. Page 42, lines 6-7 and line 14 refer to elements 36, 38 and 32 in Figure 16 and should refer to elements 436, 438 and 432.

Claim Objections

11. Claims 2, 6, 20 and 24 are objected to because of the following informalities. Appropriate correction is required.
12. Claims 2, 6, 20 and 24 recite "the step" it would be better if written, "a step".

Claim Rejections - 35 USC § 112

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

14. Claims 1-3 and 19-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

15. Claims 1 and 19 recite the limitation "the block diagram" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 101

16. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

17. Claims 1-14, 19-32 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 1-14 recite a manipulation of abstract ideas and produce no concrete, useful or tangible result. Claims 19-32 are directed to non-functional descriptive material since the claims recite a manipulation of abstract ideas and produce no concrete, useful or tangible result.

Claim Rejections - 35 USC § 102

18. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

19. Claims 1-38 are rejected under 35 U.S.C. 102(b) as being anticipated by The Mathworks, Inc., ("Real Time Workshop For Use With Simulink", User's Guide, Version 3, January 1999, pages xviii, 1-3-1-5, 1-12, 3-1-3-6, 3-19, 6-1-6-38, 7-1-7-18, 12-18-12-19), herein referred to as Mathworks.

20. As to Claims 1 and 19, Mathworks teaches: in an electronic device that provides a block diagram environment (page 7-2), a method comprising the steps of,

instructing a first function to invoke a portion of a first block from the block diagram executing at a first rate (page 6-6, "ModelOutputs", "ModelUpdate", tid = 0; page 7-9, last paragraph); and

instructing a second function to invoke a portion of a second block from the block diagram executing at a second rate (page 6-6, "ModelOutputs", "ModelUpdate", tid = 1; page 7-9, last paragraph), wherein each of said functions unconditionally define an execution path for each of the rates (page 6-7, last paragraph; page 7-9, last paragraph).

21. As to Claims 2 and 20, Mathworks teaches: the step of instructing a third function to invoke another portion of the first block from the block diagram executing at the first rate, wherein the third function relates to the first function and the third function implicitly

corresponds to a subsystem of the first block (page 7-5, "Executing Multitasking Models", paragraph 1).

22. As to Claims 3 and 21, Mathworks teaches: wherein the first and second functions are associated with an argument list having selected arguments necessary for invoking the first and second function, respectively (page 6-6-6-7, "tid" and description).

23. As to Claims 4 and 22, Mathworks teaches: in an electronic device that provides a block diagram environment (page 7-2), a method, comprising the steps of,

providing a block diagram having a plurality of systems, wherein a first group of systems process data at a first rate and a second group of systems process data at a second rate (page 7-2, paragraph 3);

generating a first set of functions, the first set of functions being associated with the first group of systems to invoke said first group of systems implicitly therefrom (page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1; pages 6-6-6-7); and

generating a second set of functions, the second set of functions being associated with the second group of systems to invoke said second group of systems implicitly therefrom (page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1; pages 6-6-6-7).

24. As to Claims 5 and 23, Mathworks teaches: wherein the block diagram has one or more subsystems that process data at one of the first rate and the second rate (page 7-2, paragraph 3; page 7-5, "Executing Multitasking Models", paragraph 1).

25. As to Claims 6 and 24, Mathworks teaches: the step of generating a set of sub-functions, the set of sub-functions being associated with the subsystems to invoke said subsystems implicitly therefrom (page 7-2, paragraph 3; page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1).

26. As to Claims 7 and 25, Mathworks teaches: in an electronic device that provides a block diagram environment (page 7-2), a method comprising the steps of,

providing/importing into a block diagram a block diagram that includes a block having functions defined in a mechanism outside of the block diagram (page 1-4, "The Generated Code", paragraphs 2 and 4; pages 12-18-12-19);

identifying portions of the block by a rate of operation (page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1), and

grouping code for the block into a plurality of functions, wherein there exists at least one function for each portion of the block identified (page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1, page 6-7, last paragraph).

27. As to Claims 8, 26 and 36, Mathworks teaches: wherein the grouping of the code comprises sets of code statements free of logical predicates (page 7-5, "Executing Multitasking Models", paragraph 1).

28. As to Claims 9 and 27, Mathworks teaches: wherein the mechanism comprises a selected programming environment (page 1-4, "The Generated Code").

29. As to Claims 10 and 28, Mathworks teaches: wherein the selected programming environment comprises a structured programming environment (page 1-4, "The Generated Code"; page 6-2 and Table 6-1 wherein C is used).

30. As to Claims 11 and 29, Mathworks teaches: wherein the selected programming environment comprises an object oriented programming environment (Figure 6-1; page 6-4, paragraphs 1 and 2).

31. As to Claims 12 and 30, Mathworks teaches: in an electronic device that provides a block diagram environment (page 7-2), a method comprising the steps of,

providing a block having two or more components that execute at different rates (page 7-2, paragraph 3; page 7-5, "Executing Multitasking Models", paragraph 1);

separating generated code for the block into two or more sets of code statements, with one set of code statements for each rate (page 7-5; "Executing Multitasking Models", paragraph 1; "Multitasking and Pseudomultitasking", paragraph 1); and

associating each of the sets of code statements with a corresponding one of the components of the block (page 7-5, "Executing Multitasking Models", paragraph 1; "Multitasking and Pseudomultitasking", paragraph 1).

32. As to Claims 13 and 31, Mathworks teaches: wherein the block performs one or more functions defined by a mechanism outside a context of a model in which the block operates (page 1-4, "The Generated Code", paragraphs 2 and 4; pages 12-18-12-19).

33. As to Claims 14 and 32, Mathworks teaches: wherein the step of associating each of the sets of code statements with a corresponding one of the components of the

block based on rate performs an implicit association providing an unconditional execution path for each set of code statements (page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1).

34. As to Claims 15 and 17, Mathworks teaches: in an electronic device providing a block diagram environment (page 7-2), a method for generating code from a multi-rate block diagram model having one or more sub-systems that include an elementary block having two or more operating rates, the multi-rate block diagram model performing a plurality of operations at a plurality of operating rates (page 7-5, "Executing Multitasking Models", paragraph 1), the method comprising the steps of,

identifying the plurality of operating rates contained in the multi-rate block diagram model, wherein each block in the multi-rate block diagram model has one or more operating rates and each of the plurality of identified operating rates indicates a rate of an associated operation of one of the blocks in the multi-rate block diagram model (page 7-5, "Executing Multitasking Models", paragraph 1; page 6-7, last paragraph);

generating code from the multi-rate block diagram model, the generated code having one function for each identified operating rate, wherein each of the functions provides implicit identification of one of the identified plurality of operating rates per groups of blocks in the multi-rate block diagram model (page 1-4, "The Generated Code"; pages 6-6-6-7; page 6-18 "MdlOutput", "MdlUpdate"); and

generating code from the multi-rate block diagram model for the one or more sub-systems, the generated code having a sub-function corresponding to a selected

one of the plurality of identified operating rates for the elementary blocks in the sub-systems and relate to the function for the selected operating rate, wherein the sub-function provides implicit identification of the selected operating rate per a subsystem of the groups of blocks (page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1; pages 6-6-6-7).

35. As to Claims 16 and 18, Mathworks teaches: wherein each of the functions generated for each of the plurality of identified operating rates invokes only the blocks executing the rate to which the function corresponds (page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1; page 6-6 and page 6-7, last paragraph).

36. As to Claim 33, Mathworks teaches: an electronic device for use in practicing a technical computing environment, the technical computing environment for developing and performing engineering and scientific related functions, the electronic device comprising,

an input device for use by a user (page xviii, paragraph 2);

a block diagram environment providing a block diagram model having a first block operating at a first rate and a second block operating at a second rate (page 7-2; page 7-5, "Executing Multitasking Models", paragraph 1); and

a code generation tool for generating code from the block diagram model, the code including one function for the first rate and one function for the second rate, wherein when instructed the first function invokes an operation operating at the first rate and the second function invokes an operation operating at the second rate (page 1-4,

"The Generated Code"; pages 6-6-6-7; page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1).

37. As to Claim 34, Mathworks teaches: wherein the first function and the second function implicitly invoke the operation operating at the first rate and implicitly invoke the operation operating at the second rate, respectively (pages 6-6, 6-7, last paragraph, "tid"; page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1).

38. As to Claim 35, Mathworks teaches: wherein the code generation tool is configured to group code for the first and second function (page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1).

39. As to Claim 37, Mathworks teaches: wherein a first set of code statements corresponds to the first rate and a second set of code statements corresponds to the second rate (page 7-5, "Executing Multitasking Models", paragraph 1, "Multitasking and Pseudomultitasking", paragraph 1; page 6-6, "tid = 0", "tid" = 1).

40. As to Claim 38, Mathworks teaches: an interface responsive to inputs from the user to communicate with the code generation tool to generate code from the block diagram model (page 3-5; page 3-6, paragraphs 1 and 2).

Conclusion

41. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

42. Newman et al (US Patent 5,313,615) teaches a method for ordering computer software procedures in an order in computing machine for modeling each of multiple blocks of a block diagram.

43. Schneider et al (US Patent 6,718,533) teaches a development tool that combines the advantages of a simulation tool with an object-oriented modeling tool, including a real-time mathematical matrix library and an object model.

44. Englehart et al ("ControlH: An Algorithm Specification Language and Code Generator", IEEE Control Systems Magazine, Volume 15, Issue 2, April 1995, Page(s): 54 – 64) teaches the language and control generator, ControlH, that generates high quality modular Ada or C from ControlH specifications.

45. Jersak et al ("A Transformational Approach to Constraint Relaxation of a Time-Driven Simulation Model", Proceedings of the 13th Annual Symposium on System Synthesis, 20-22 Sept. 2000, Page(s): 137 - 142) teaches a translation of a time-driven simulation model into SPI, a common intermediate representation for heterogeneously specified embedded systems, using Simulink.

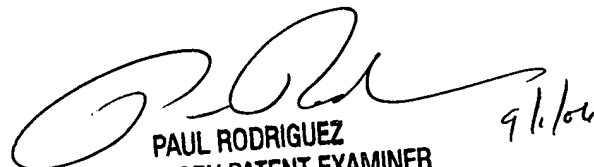
46. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary C. Jacob whose telephone number is 571-272-6249. The examiner can normally be reached on M-F 7AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mary C. Jacob
Examiner
AU2123

MCJ
8/31/06


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